

# Refrigeration & Air Treatment Systems

# Phase 4

## Phase 4 Overview + Checklists

Phase 4 focuses on refrigeration and air treatment systems used to remove moisture and contaminants from compressed air systems. Technicians will review heat transfer principles, refrigeration system operation, and desiccant dryer function

and controls. This phase also covers filtration, condensate management, system components, and common troubleshooting practices to ensure reliable air treatment system performance in the field.

### Week 1:

#### Thermal & Pressure Fundamentals

Understand heat transfer, temperature, pressure, and moisture behavior in compressed air systems and how these principles affect air treatment.

Day 1	Day 2	Day 3	Day 4	Day 5	Week 1 Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Week 2:

#### Refrigeration System Fundamentals

Learn how refrigeration dryers remove moisture by cooling compressed air. Review system components, operating cycle, and key measurements.

Day 1	Day 2	Day 3	Day 4	Day 5	Week 2 Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Week 3:

#### Desiccant Dryer Operation & Troubleshooting

Study adsorption drying principles, dryer cycles, and control systems. Learn how desiccant dryers operate and how to diagnose common faults.

Day 1	Day 2	Day 3	Day 4	Day 5	Week 3 Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Week 4:

#### Air Treatment Components & Filtration

Review filtration, separators, drains, and dryer components. Learn testing, adjustment, and troubleshooting of air treatment equipment.

Day 1	Day 2	Day 3	Day 4	Day 5	Week 4 Review
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### Refrigeration & Thermal Fundamentals

- Heat transfer methods (conduction, convection, radiation)
- Relationship between temperature, pressure, and moisture in air
- Sensible vs latent heat
- Compression/expansion effect on temp.
- "20-degree rule" + moisture behavior
- Dewpoint meaning and measurement
- Moisture removal through cooling

#### Refrigeration Dryer Operation

- 4 major refrigeration system components
- Refrigeration cycle fundamentals
- Refrigeration compressor function
- Condenser operation and heat rejection
- Evaporator function + moisture removal
- Metering device + refrigerant control
- Superheat and subcooling concepts
- PT charts + temp./pressure interpretation
- HPCO and LPCO safety devices
- Hot gas bypass valve operation

#### Desiccant Dryers & Air Treatment Components

- Adsorption drying principles
- Desiccant dryer tower switching/regeneration
- Heatless vs heated dryer operation
- Purge air function and adjustment
- Dryer valves, solenoids, and control signals
- Coalescing vs particulate filters
- Oil-water separators (PolySep) operation
- Condensate drains and electronic no-loss drains
- Non-lube modules and line filtration
- Air treatment system troubleshooting fundamentals

# Review Topics

Name: \_\_\_\_\_

Phase Start Date: \_\_\_\_\_

